REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application. Claims 1-27 are pending, of which claims 1, 15, 17, and 23 have been amended. Support for the amendments can be found in the specification at least at p.14 lines 11-15, and at p.12 lines 1-7.

35 U.S.C. § 101 Claim Rejection

Claims 1-27 are rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter (*Office Action*, p.3). Specifically, each of the independent claims 1, 15, 17, and 23 are rejected as failing to produce a useful or tangible result, while dependent claims 2-14, 16, 18-22, and 24-27 are rejected as inheriting the deficiency of practical application requirements of the respective independent claims from which they depend (*Office Action,* pp.3-4).

Without conceding the propriety of the stated rejections, claims 1, 15, 17, and 23 have been amended to clearly satisfy the utility requirement of 35 U.S.C. §101. As amended, each of the independent claims now recites "wherein the data structure facilitates dissemination of information to the DHT nodes and gathering of information from the DHT nodes." This and other utilities are described in detail in the specification as-filed.

In the "Background" section, Applicant describes that data gathering and dissemination are problematic in current peer-to-peer (P2P) systems because such systems are formed by a loose alliance of interconnected peers that can feely come and go, and that accordingly there is a need for an efficient strategy for interacting with P2P distributed hashing tables (DHT) that will allow for the gathering of data

from participants (*i.e.,* DHT nodes) and the dissemination of information to its participants (*i.e.*, DHT nodes) in such P2P systems (*Specification*, p.4 lines 9-16).

The data structure facilitates dissemination of information to the DHT nodes and gathering of information from the DHT nodes by virtue of being implemented on top of the DHT. For example, because the data structure is implemented on top of the DHT, the data structure can be configured to be self-organizing and self-healing on a same scale as the DHT, as DHT nodes are added to and deleted from the logical space (*Specification,* p.12 lines 1-7).

35 U.S.C. §103 Claim Rejection

Claims 1-27 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Application No. 2004/0064693 to Pabla et al. (*hereinafter,* "Pabla") in view of a publication entitled "P2P Systems Based on Distributed Hash Table" by Ming Xie dated September 26, 2003 (*hereinafter,* "Xie") (*Office Action,* p.5). Applicant respectfully traverses the rejection.

Claim 1 recites a method for building a data overlay, comprising:

> providing a distributed hash table (DHT) that governs the insertion and retrieval of objects into and from a peer-to-peer system, wherein the distributed hash table includes a logical space including a plurality of DHT nodes having an associated plurality of DHT zones; and
>
> building the data overlay as a data structure on top of the logical space of the distributed hash table by associating objects in the data structure with the DHT nodes, and by establishing links between the objects in the data structure, wherein the data structure facilitates dissemination of information to the DHT nodes and gathering of information from the DHT nodes.

The Office acknowledges that Pabla does not teach "...building the data overlay as a data structure on top of the logical space of the distributed hash table by associating objects in the data structure with the DHT nodes, and by establishing links between the objects in the data structure...", as recited in claim 1, and relies on Xie to cure the deficiencies of Pabla (*Office Action*, p.6).

To support its obviousness rejection of claim 1, the Office appears to rely on the final section of Xie which is entitled "Summary and Future Work" (*Office Action*, p.6; *Xie,* p.6). This final section of Xie states that "[t]he current researches are focusing on using different topologies, such as torus, ring, de bruijn, butterfly and so on, to achieve better routing performance..." and that "[t]he future work will overlay different topologies to achieve efficient routing...such as the overly network of de bruijn and Chord ring, *k* Chord rings, *k* de bruijns etc." (*Office Action*, p.6; *Xie,* p.6).

Xie does not disclose or suggest "...building the data overlay as a data structure on top of the logical space of the distributed hash table by associating objects in the data structure with the DHT nodes, and by establishing links between the objects in the data structure...", as recited in claim 1. Instead, the cited description in Xie appears to be directed to combining two different DHT routing strategy configurations/topologies with each other to form a combined DHT routing strategy. For example, a CAN strategy (having a "d-Torus" topology) for managing the storage and retrieval of objects in a P2P system might be combined with a CHORD strategy (having a "Ring" topology) for managing the storage and retrieval of objects in a P2P system to create a new DHT routing strategy which has a new topology that is a combination or of the "d-Torus" and the "Ring" topologies.

As such, the Pabla-Xie combination fails to teach or suggest all of the features recited in claim 1. Accordingly, claim 1 is allowable over the Pabla-Xie combination for at least the reasons described above, and Applicant requests that the §103 rejection of claim 1 be withdrawn.

Claims 2-14 are allowable over the Pabla-Xie combination by virtue of their dependency upon allowable claim 1. Additionally, one or more of claims 2-14 are allowable for independent reasons. For example:

Claim 4 recites "wherein the data overlay has a topology of a tree, the tree having a plurality of tree nodes associated with respective DHT nodes, wherein each tree node has a respective tree node zone associated therewith which corresponds to a part of the logical space of the distributed hash table." Pabla and/or Xie fail to teach or suggest all of the features recited in claim 4.

To support the rejection of claim 4, the Office again cites to the final section of Xie (*Office Action*, p.6; *Xie,* p.6 lines 1-3). As described above in response to the rejection of claim 1, the cited portion of Xie appears to be directed to combining two different DHT routing strategy configurations/topologies with each other to form a combined DHT routing strategy. Accordingly, there is no disclosure of suggestion that "the data overlay has a topology of a tree, the tree having a plurality of tree nodes associated with respective DHT nodes, wherein each tree node has a respective tree node zone associated therewith which corresponds to a part of the logical space of the distributed hash table", as recited in claim 4. In any case, combining the different DHT routing strategy topologies in Xie would not yield a data overlay which has the topology of a tree, as described in claim 4.

The Office also cites to Pabla to support the rejection of claim 4 (*Office Action,* p.12; *Pabla,* ¶¶[0085], [0091], [0092]; ¶[0456]; and ¶[0685]). As noted above in response to the rejection of claim 1, Pabla does not teach or suggest building the data overlay as a data structure on top of the logical space of the distributed hash table, as described in claim 1. Accordingly, Pabla cannot disclose or suggest "wherein the data overlay has a topology of a tree, the tree having a plurality of tree nodes associated with respective DHT nodes, wherein each tree node has a respective tree node zone associated therewith which corresponds to a part of the logical space of the distributed hash table", as recited in claim 4.

Instead, Pabla describes using "router peers" 244 which are dedicated to message routing of information to "peers" 210 (*Pabla,* ¶¶[0679], [0684], [0685] and Fig.19). The "router peers" 244 of Pabla are not part of a data structure which is built on top of the logical space of the distributed hash table, but are instead devices for routing messages to "peers" 210 (*Pabla,* ¶¶[0679], [0684], and [0685]). Regardless, the routing peers in Pabla do not teach or suggest the topology of a tree which is described in claim 4.

Claim 15 recites a computer readable store having stored thereon a data structure, comprising:

> a logical space of a distributed hash table (DHT), including a plurality of DHT nodes having a plurality of associated DHT zones, wherein the distributed hash table governs the insertion and retrieval of objects into and from a peer-to-peer system;
>
> a data overlay implemented as a data structure on top of the logical space of the distributed hash table logical space, wherein the data overlay uses services provided by the distributed hash table in routing from one object to another in the data structure, and wherein the data structure facilitates dissemination of information to the DHT nodes and gathering of information from the DHT nodes.

The Office acknowledges that Pabla does not teach "a data overlay implemented as a data structure on top of the logical space of the distributed hash table logical space, wherein the data overlay uses services provided by the distributed hash table in routing from one object to another in the data structure", as recited in claim 15, and relies on Xie to cure the deficiencies of Pabla (*Office Action*, p.9).

To support the rejection of claim 15, the Office cites to pages 4 and 6 of Xie (*Office Action*, p.9; *Xie,* pp. 4 and 6). Xie describes DHTs at page 4 which are described in the "Background" section of the subject application (*Specification,* pp.1-4). Xie also states that "[t]he current researches are focusing on using different topologies, such as torus, ring, de bruijn, butterfly and so on, to achieve better routing performance..." and that "[t]he future work will overlay different topologies to achieve efficient routing...such as the overly network of de bruijn and Chord ring, *k* Chord rings, *k* de bruijns etc" (*Xie,* p.6).

Xie does not disclose or suggest "...a data overlay implemented as a data structure on top of the logical space of the distributed hash table logical space, wherein the data overlay uses services provided by the distributed hash table in routing from one object to another in the data structure...", as recited in claim 15. Instead, the cited description in Xie appears to be directed to combining two different DHT routing strategy configurations/topologies with each other to form a combined DHT routing strategy. For example, a CAN strategy (having a "d-Torus" topology) for managing the storage and retrieval of objects in a P2P system might be combined with a CHORD strategy (having a "Ring" topology) for managing the storage and retrieval of objects in a P2P system to create a new DHT routing strategy which has a topology that is a combination or of the "d-Torus" and the "Ring" topologies.

As such, the Pabla-Xie combination fails to teach or suggest all of the features recited in claim 15. Accordingly, claim 15 is allowable over the Pabla-Xie combination for at least the reasons described above, and Applicant requests that the §103 rejection of claim 15 be withdrawn.

Claim 16 is allowable over the Pabla-Xie combination by virtue of its dependency upon allowable claim 15. Additionally, claim 16 may also be allowable for independent reasons.

Claim 17 recites a method for passing data through a data overlay, comprising:

> providing a distributed hash table (DHT) that governs the insertion and retrieval of objects into and from a peer-to-peer system, wherein the distributed hash table includes a logical space including a plurality of DHT nodes having a plurality of associated DHT zones;
>
> building a data overlay as a data structure on top of the logical space of the distributed hash table by associating objects in the data structure with the DHT nodes, and by establishing links between the objects in the data structure, wherein the data overlay defines a plurality of interconnected nodes, and wherein the data structure facilitates dissemination of information to the DHT nodes and gathering of information from the DHT nodes; and
>
> routing data through the data overlay by passing the data through its interconnected nodes.

The Office acknowledges that Pabla does not teach "...building a data overlay as a data structure on top of the logical space of the distributed hash table by associating objects in the data structure with the DHT nodes, and by establishing links between the objects in the data structure, wherein the data overlay defines a plurality of interconnected nodes...", as recited in claim 17, and relies on Xie to cure the deficiencies of Pabla (*Office Action*, p.7).

To support the rejection of claim 17, the Office cites to pages 4 and 6 of Xie (*Office Action*, p.9; *Xie,* pp. 4 and 6). As described above in response to the rejection of claim 15, Xie does not disclose or suggest "...building a data overlay as a data structure on top of the logical space of the distributed hash table by associating objects in the data structure with the DHT nodes, and by establishing

links between the objects in the data structure, wherein the data overlay defines a plurality of interconnected nodes…", as recited in claim 17.

As such, the Pabla-Xie combination fails to teach or suggest all of the features recited in claim 17. Accordingly, claim 17 is allowable over the Pabla-Xie combination for at least the reasons described above, and Applicant requests that the §103 rejection of claim 17 be withdrawn.

Claims 18-22 are allowable over the Pabla-Xie combination by virtue of their dependency upon allowable claim 17. Additionally, one or more of these claims may also be allowable for independent reasons.

Claim 23 recites a peer-to-peer system including a plurality of machines interacting in peer-to-peer fashion, comprising:

> a logical space of a distributed hash table (DHT), including a plurality of DHT nodes having a plurality of associated DHT zones, wherein the distributed hash table governs the insertion and retrieval of objects into and from the peer-to-peer system; and
>
> a data overlay implemented as a data structure on top of the logical space of the distributed hash table, wherein the data overlay uses services provided by the distributed hash table in routing from one object to another in the data structure,
>
> wherein the logical space of the distributed hash table and the data overlay are implemented in distributed fashion in respective stores of the plurality of machines in the peer-to-peer system

The Office acknowledges that Pabla does not teach "…a data overlay implemented as a data structure on top of the logical space of the distributed hash

table, wherein the data overlay uses services provided by the distributed hash table in routing from one object to another in the data structure", as recited in claim 23 (*Office Action*, p.10). Further, the Office acknowledges that Pabla does not teach "...wherein the logical space of the distributed hash table and the data overlay are implemented in distributed fashion in respective stores of the plurality of machines in the peer-to-peer system...", as recited in claim 23 (*Office Action*, p.10). The Office relies on Xie to cure the each of the deficiencies of Pabla (*Office Action*, p.10).

To support the rejection of claim 23, the Office cites to pages 4 and 6 of Xie (*Office Action*, p.10; *Xie,* pp. 4 and 6). As described above in response to the rejection of claims 15 and 17, Xie does not disclose or suggest "...a data overlay implemented as a data structure on top of the logical space of the distributed hash table, wherein the data overlay uses services provided by the distributed hash table in routing from one object to another in the data structure...", as recited in claim 23. Further Xie does not disclose or suggest "...wherein the logical space of the distributed hash table and the data overlay are implemented in distributed fashion in respective stores of the plurality of machines in the peer-to-peer system...", as recited in claim 23.

As such, the Pabla-Xie combination fails to teach or suggest all of the features recited in claim 23. Accordingly, claim 23 is allowable over the Pabla-Xie combination for at least the reasons described above, and Applicant requests that the §103 rejection of claim 23 be withdrawn.

Claims 24-27 are allowable over the Pabla-Xie combination by virtue of their dependency upon allowable claim 23. Additionally, one or more of these claims may also be allowable for independent reasons.

Conclusion

All pending claims 1-27 are in condition for allowance, and Applicant respectfully requests reconsideration and issuance of the subject application. If any issues remain that prevent issuance of this application, the Examiner is urged to contact the undersigned attorney before issuing a subsequent Action.

Respectfully Submitted,

Dated: Oct. 19, 2006 By: 

David A. Morasch
Lee & Hayes, PLLC
Reg. No. 42,905
(509) 324-9256 x 210